

CLAIMS

What is claimed is:

1. A method for fracturing different levels of a completion interval of a subterranean formation which is traversed by a wellbore of a well, said method comprising:

positioning a workstring in said wellbore, said
5 workstring including a cross-over and a fracturing string; said
fracturing string extending substantially through said
completion interval and forming a completion interval annulus
with said wellbore when said workstring is in an operable
position within said wellbore; said fracturing string
10 comprising:

a string of blank, base pipe having a plurality of
perforated sections spaced along its length; and

at least one alternate flow path extending along said
base pipe;

15 flowing a fracturing slurry, comprised of a
fracturing liquid and proppants, into said completion interval
annulus whereupon liquid from said fracturing slurry is lost
into said completion interval and into said base pipe through
said perforated sections thereby allowing said proppants to form
20 blockages at said perforated sections, said blockages
effectively isolating those portions of said completion annulus
which lie between respective adjacent, perforated sections; and

continuing to flow said fracturing slurry into said
completion annulus after said blockages have been formed and
25 delivering said fracturing slurry through said at least one
alternate flow path to said isolated portions of said completion
interval annulus to thereby fracture said different levels of
said completion interval which lie adjacent said respective
isolated portions of said completion interval annulus.

30

2. The method of claim 1 wherein said fracturing
fluid is a high-viscosity gel and said proppants in said slurry
are sand.

3. The method of claim 1 wherein said pad of fracturing a high-viscosity gel without proppants is injected into said completion interval before said slurry is injected.

4. The method of claim 1 wherein said at least one alternate flow path is comprised of shunt tubes which are spaced radially around said fracturing string and which substantially extend through said completion interval, each of said shunt
5 tubes having inlet and a plurality of outlet openings spaced along its length.

5. The method of claim 1 wherein said at least one alternate flow path is comprised of shunt tubes which are spaced radially around said fracturing string and which are of different lengths extending into said completion interval, each
5 of said shunt tubes having inlet and at least one outlet spaced along its length.

6. The method of claim 3 including:
isolating said completion annulus from the remainder of the well annulus prior to pumping said fracturing slurry into said completion interval annulus; and
5 opening said remainder of the well annulus at the surface to flow.

7. The method of claim 3 wherein said fracturing slurry is flowed down said workstring and out through said cross-over into the top of said completion interval annulus.

8. The method of claim 1 including:
ceasing the flow of said fracturing slurry into said completion interval annulus when said different levels of said completion interval has been fractured; and
5 producing said well by flowing production fluids from said completion interval into said completion interval annulus and into said base pipe through said perforated sections.

9. An apparatus for fracturing different levels of a completion interval of a subterranean formation which is traversed by a wellbore of a well, said apparatus comprising:

a workstring comprising:

5 a tubing string;

a cross-over connected to the lower end of said tubing string; and

a fracturing string connected to said cross-over; said fracturing string comprising:

10 a length of blank, base pipe having a plurality of perforated sections spaced along its length, each of said perforated sections having a plurality of openings through said base pipe which extend along a portion of said length of said base pipe; and

15 at least one alternate flow path extending along said length of said base pipe; said at least one alternate flow path having an inlet and at least one outlet therein.

10. The apparatus of claim 9 including:

screen means positioned on said base pipe and over said plurality of openings in each of said perforated sections to allow flow of fluids into said base pipe through said perforated sections while preventing the flow of particulate material into said base pipe therethrough.

11. The apparatus of claim 9 wherein said alternate flowpath comprises:

5 a shunt tube extending longitudinally along said base pipe and having an inlet and at least one outlet spaced along its length.

12. The apparatus of claim 9 wherein said alternate flowpath comprises:

5 a plurality of shunt tubes spaced radially around said fracturing string and extending longitudinally along said base pipe, each of said shunt tubes having an inlet and a plurality of outlet openings spaced along their respective lengths.

13. The apparatus of claim 9 wherein the length of each of said perforated sections along said base pipe is from about 1 to about 300 feet.

14. The apparatus of claim 9 wherein the length of each of said perforated sections along said base pipe is from about 5 to about 30 feet.

15. The apparatus of claim 9 wherein the said perforated sections are spaced from each other along said base pipe at a distance of from about 10 feet to about 1000 feet.

16. The apparatus of claim 10 wherein screen means comprises:

5 wire wrapped around said base pipe and over said openings in said perforated sections, the coils of said wire having gaps therebetween to form passageways through which fluids can pass but which block the flow of particulates therethrough.

17. The apparatus of claim 16 wherein said wire is wrapped over said at least one shunt tube at at least one of said perforated sections.

18. The apparatus of claim 16 wherein said at least one shunt tube passes over said wire at at least one of said perforated sections.

19. The apparatus of claim 18 including:

a perforated sleeve positioned over said at least one shunt tube and said wire at at least one of said perforated sections.

20. The apparatus of claim 10 wherein a portion of said length of said shunt tube is blank without any said outlet being positioned along said blank portion of said shunt tube whereby there is no flow from the shunt tube throughout said
5 blank portion of said length of said shunt tube.